

What is claimed is:

- 1        1. A tissue culture system comprising:
  - 2            (a) at least one isolated neural cell expressing at least one LPA
  - 3            receptor;
  - 4            (b) a lysophosphatidic acid (LPA) compound; and
  - 5            (c) a basal culture medium.
- 1        2. The tissue culture system of claim 1, wherein the form of said LPA
- 2        compound is selected from the group consisting of LPA 20:5, 18:1 (oleoyl), 16:0
- 3        (palmitoyl), and 14:0 (myristoyl).
- 1        3. The tissue culture system of claim 2, wherein the form of said LPA
- 2        compound is 18:1 (oleoyl) or 16:0 (palmitoyl).
- 1        4. The tissue culture system of claim 1, wherein said isolated neural cell is a
- 2        stem/progenitor cell.
- 1        5. The tissue culture system of claim 4, wherein said neural stem/progenitor
- 2        cell is situated within a neurosphere.
- 1        6. The tissue culture system of claim 4, wherein said neural stem/progenitor
- 2        cell is derived from a mammal.
- 1        7. The tissue culture system of claim 6, wherein said mammal is a mouse.
- 1        8. The tissue culture system of claim 6, wherein said mammal is a human.
- 1        9. The tissue culture system of claim 1, wherein said LPA receptor expressed
- 2        by said neural cell is selected from the group consisting of an LPA1, LPA2, and LPA3
- 3        receptor.

1           10. The tissue culture system of claim 1, wherein said stem/progenitor cell  
2 expresses at least one of a Sca-1 and an AC133 antigen, and at least one of an LPA1,  
3 LPA2 and LPA3 receptor.

1           11. The tissue culture system of claim 10, wherein said stem/progenitor cell  
2 further expresses at least one marker of neuronal differentiation selected from the group  
3 consisting of  $\beta$ III tubulin, and nestin.

1           12. A method of culturing at least one neurosphere from isolated brain cells,  
2 the method comprising the steps of:

3               (a) providing at least one isolated brain cell; and  
4               (b) culturing said at least one brain cell in a medium containing a  
5 lysophosphatidic acid (LPA) compound under conditions that allow for growth and  
6 differentiation of a neurosphere from said isolated brain cell.

1           13. The method of claim 12, wherein the step (b) of culturing the at least one  
2 brain cell under conditions that allow for growth of a neurosphere further allows for  
3 proliferation and differentiation of the cells within said neurosphere into at least one cell  
4 type selected from the group consisting of a neuron, an astrocyte and an oligodendrocyte.

1           14. The method of claim 13, wherein said at least one cell type is a neuron,  
2 wherein at least one lineage-specific marker is expressed by said cell, said marker  
3 selected from the group consisting of  $\beta$ III tubulin and nestin.

1           15. An isolated neural cell cultivated in a basal culture medium comprising a  
2 lysophosphatidic acid (LSA) compound.

1           16. The isolated neural cell of claim 15, wherein said cell is a stem/progenitor  
2 cell.

1           17. The isolated neural cell of claim 15, wherein the form of said LPA  
2 compound is selected from the group consisting of LPA 20:5, 18:1 (oleoyl), 16:0  
3 (palmitoyl), and 14:0 (myristoyl).

1           18. The isolated neural cell of claim 17, wherein the form of said LPA  
2 compound is LPA 18:1 (oleoyl) or LPA 16:0 (palmitoyl).